

C<sup>1</sup>  
26. The semiconductor laser diode according to claim 24, wherein the second width of the defined gain region is selected to support a desired lateral mode of the light.

27. The semiconductor laser diode according to claim 24, wherein the second width of the defined gain region is selected to support only a fundamental lateral mode of the light.

28. The semiconductor laser diode according to claim 27, wherein the defined gain region has a first loss to generated light and the reduced conductivity regions have a second loss to generated light greater than the first loss.

29. The semiconductor laser diode according to claim 24, wherein the second width is selected such that the reduced conductivity regions flanking the defined gain region introduce significant loss to generated light in a higher-order mode, but do not introduce significant loss to generated light in a fundamental mode.

B<sup>1</sup>  
cont.  
30. The semiconductor laser diode according to claim 24, wherein the active layer is formed of a least one of GaAs, InGaAs, AlInGaAs and InGaAsP.

31. The semiconductor laser diode according to claim 24, wherein the reduced conductivity regions are implanted with high-energy ions.

32. The semiconductor laser diode according to claim 24, wherein the reduced conductivity regions are implanted with protons of energy between about 130 KeV and 170 KeV.

33. The semiconductor laser diode according to claim 24, wherein the reduced conductivity regions have a first index of refraction and the defined gain region has a second index of refraction greater than the first index of refraction.